Formal Formulations of the Line Element as it Appears in A Sample of Microscopic Shapes

Naglaa Muhammad Farouk Ahmed[1], Aber Abdo Mohamed[2], Afaf Ahmed Mohamed Farraj[3], Ahmed Mustafa Mohamed Abdel Aziz Hassan[4]

[1]Associate Professor at the College of Culture and Arts, Department of Home Economics - College of Culture and Arts- Abha - King Khalid University, nalsaied@kku.edu.sa
[2]College of Tourism and Hospitality- King Khalid University
[3]Professor of Psychology of Art Education Department of Art Education Sciences Helwan University
[4]Professor of Design, Department of Art Education, Faculty of Specific Education, Ain Shams University

Abstracts

Problem Background: Design is that complete process of planning and creating a form in a functionally satisfying way, bringing pleasure to the soul, and satisfying human need utilitarianly and aesthetically at the same time. The design has its elements, which is the vocabulary of the language of the form used by the designer artist, and the elements of the design line, and is considered a basic means of expression in plastic art, the researcher has noted that microscopes have a variety of formulations of design elements, limited in the current research to try to reach the formal formulations of the line element as it appears in a sample of microscopes?.

The Research Problem: The problem of the current research is summarized in the following question: What are the formal formulations of the line element as it appears in a sample of microscopic shapes?

Research Objective: Detecting the formal formulations of the calligraphy element through a sample of microscopic shapes.

Hypothesis of Research: There is a positive relationship between the type of formal formulations of the line element and the type of sample of microscopic shapes.

Research Methodology: The current research follows the descriptive approach in its form: content analysis, where the researcher describes and classifies the formal formulations of the line element, as they appear in a sample of microscopic shapes.

Research Results: The research reached a set of formal formulations of the line element through the microscopic sample used in the current research.

Keywords: Line Element in Design, Formal Formulations, Microscopic Shapes.

Introduction

First: Background to the problem:

Design is that complete process of planning a form, or creating it in a functionally satisfactory way, as it brings pleasure to the soul, and satisfies the human need utilitarianly and aesthetically at the same time. (Fath al-Bab Abdel Halim, Ahmed Hafez Rashdan, 1984), and the design has its elements, which are the vocabulary of the form language used by the designer artist, and the elements of the design "line", (Ismail Shawky, 2001)

and the line is a basic means of expression in all areas of fine art, has noted the researcher through his examination of microscopes and the presence of various formulations of design elements require study, which prompted him to conduct the current research, which was limited to trying to reach the formal formulations of the line element as it appears in a sample of microscopes.

Second: The research problem:

The problem of the current research is summarized in the following question:

What are the formal formulations of the line element as it appears in a sample of microscopic shapes?

Third: Research Objective:

Detection of the formal formulations of the line element through a sample of microscopic shapes.

Fourth: Imposing Research:

There is a positive relationship between the type of formal formulations of the line element and the type of sample of microscopic shapes.

Fifth: The importance of research:

1 - Enriching the field of design with a set of formal formulations of the calligraphy element through microscopic samples.

2 - Applying the current research methodology in the search for formal formulations of the rest of the design elements such as point and color through microscopic samples.

3 - The artist's connection with the manifestations of living beings as they appear through a microscope.

Sixth: Research Methodology:

The current research follows the descriptive approach in its form: content analysis, where the researcher describes and classifies the formal formulations of the line element, as they appear in a sample of microscopic shapes.

Seventh: Sample:

The microscopic sample was selected to include: ME, bacteria, muscles, urine slides Sem, genetically modified plants, silicon, embryos, clots and yeasts, electrons.

Eighth: Theoretical Framework:

The theoretical framework deals with two axes:

First: What is meant by microscopy

Second: Calligraphy as an element of design.

Related studies:

1- Study of (Iman Ali Muhammad Al-Sharqawi, 2003.

Titled: "Mesh systems in fungal spinning as an entrance to the construction of decorative painting"

This study aims to reveal the systems of the mesh structure of the fungal yarn through the microscopic vision of the plant fungus and the extraction of a set of networks of an organic nature and use them in the construction of the decorative panel.

2. Study of (Rania Abdo Mahmoud Al-Imam, 2003)

Titled: "Plastic values of printing real contacts through microscopic vision of animal tissues and their applications in new wall hangings"

This research aims to benefit from microscopic images of animal tissues in the field of manual printing and its various methods by adding the real texture to the printed wall hanging, using prominent printing pastes and through multiple printing methods that help achieve the desired texture.

3. Study of (Ahmed Mohamed El-Sayed El-Beltagy, 2004)

Titled: "Inspiration from Microscopic Animal Cells to Create Photographic Works".

This study aims to identify new sources for creating innovative photographic works by drawing inspiration from animal cells and seeing them under an electron microscope and making these microscopic images the basis for artworks.

4. Study of (Haitham Wafik Madbouly, 2004)

Titled: "Computer Graphics Design to Simplify Concepts of Genetic Engineering for Early Adolescence"

This study aims to use the capabilities of the computer in designing illustrations to simplify the concepts of genetic engineering for middle school students, and to study the effectiveness of illustrations prepared by the researcher in communicating the concepts of genetic engineering to students of the selected stage.

5. Study of (Michael Weinstock, 2006)

Titled: "A study of symmetric systems in biological materials and their application in architectural designs".

This study indicates that cellular biomaterials have the same complex internal structures, and this study has dealt with the cellular engineering system of foam that contains open, flexible and strong structural systems at the same time, in recent years, new design strategies have emerged. New technologies have made large materials and structures based on biological models of processes in which natural physical forms have been found, where biological organisms have found many different forms.

6. Study of (Huda Abdul Aziz Muhammad Matar, 2010)

Titled: "Genetic code systems in living organisms as a source for the development of aesthetic formulations to enrich decorative design". This study dealt with genetic code systems in living organisms as a source for the development of aesthetic formulations to enrich decorative design. This study included five chapters "Chapter I" dealt with the definition of research and dealt with "Chapter II" structural systems and stages of development of concepts of genetics up to the concept of genetic code and dealt with "Chapter III" systems genetic code in biological art and images in some artworks and in decorative designs and dealt with "Chapter IV" formal systems of genetic code and structural design.

First – Microscopy:

What is meant here are bodies and living organisms seen through the microscope The research relied on a study of samples of human cells and samples of animals and plants, types of different bacteria and fungi, viruses and blood samples, and then added important characteristics of the cell after the discovery of the microscope where it was found that the cell is an isolated organism (from other cells) with a cell wall or cell membrane containing inside it a group of subcellular components (some of them are only present in all cells in general) such as: nucleic acids, proteins, fats and carbohydrates) and although cells are different, they are all dynamic active in the sense that they are in a state of constant change as a result of renewing their components. (Iman Ahmed Mahmoud, 2002)

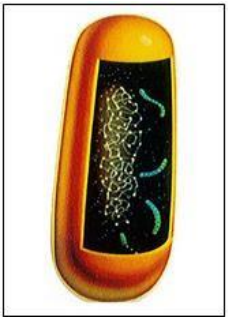

Figure (1) Cell Fact Nucleus Figure (2) Prokaryotic cell

A – The cell and its relationship to the surrounding world:

Cells do not live in isolation from the outside world only, but constantly receive information about the surrounding environment, and in order to receive this information, cells have cellular sensitivity that detects chemical, physical, electrical and thermal stimuli, and when sensing certain changes, the cell responds to secure its survival, and the membrane plays an important role in these processes because it contains many intentions capable of distinguishing and the cell responds to stimuli in different ways, for example, when the body is infected with an infection, it releases chemicals that attract white blood cells to areas infected.

B - Components of the bacterial cell:

The components of a bacterial cell are divided into primary components and non-primary components.

* Invariant Components:

They are found in all prokaryotic organisms and are necessary for life and include the cell membrane, protoplasm with its rhbosomes and the nuclear part.

* Non-core Variant Components:

They are found in some, but not all, primitive nucleolites and include the cell wall, capsule, gelatinous layer, flagella, fixing organs, sexual appendages, internal bodies such as stored substances, gas vacuoles and spores.

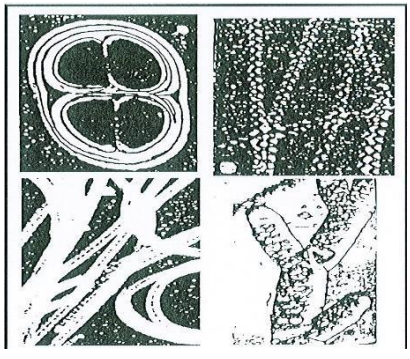

Figure (3) Differences in the phenotypic shape of bluish-green bacteria

It is through these concepts and divisions of the world of microscopic shapes and cells, It is clear to us how the plastic artist was able to take advantage of the structural systems and aesthetic values of forms and microscopic cells in drawing inspiration from innovative works of art derived from the laws of nature.

Hence, we say that the artist's goal of his research behind the scientific discoveries and fields of vision made available by modern scientific devices from lenses through the microscope to the electron microscope is a new addition to art to enrich the areas of artistic creativity and aesthetic value of these forms in nature and not only from their external form, but also internal and

accurate, and real beauty that the eye can only see through the microscope and through the world of microscopes is shed light on microscopic art that serves plastic art and artists in All fields of art, whether from far or near.

And I'm going to show some of the shapes that were seen under the microscope and showed real beauty and natural artistic creativity, and that shapes, cells and microorganisms explained under the microscope a lot of rhythm and diversity in texture and harmonious color distribution.

And the difference of spaces and colors, and this was what was looking for a lot of plastic artists in the past, such as Picasso, Mondrian or Vazrelli and many geniuses, and now with modern scientific discoveries, man realized the disclosure of the artistic and aesthetic value not only from the appearance of the forms surrounding us, but also from the interior and through the smallest details that illustrate the ability of the Creator (God Almighty) as stated in the verse "and creates what you do not know" The truth of God Almighty - Surat Al-Nahl - Verse number (4). That is, God Almighty is able to create what He wants from what we know and from what we do not know, and what we have of knowledge except what God Almighty has taught us.

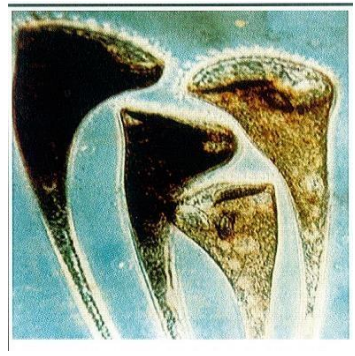

Figure (4) cilia-shaped cells belonging to protozoa

Cells belonging to the protozoa in the form of cilia parasitize on the human foot, and this shape consists of four conical shapes approximately, and we note the relations of juxtaposition and contact between those forms as if there is a dialogue between them, perfection we can realize the value of balance in those forms and that the gram of the small size of the lower limbs that they rely on in their reliance on them and despite the large size of their upper end and the weight it represents on their fulcrum, but they are in a balanced position, as we note the enrichment of the shape through texture On the surfaces of these cones and the contrast between dark and light and through the lengths of these shapes we realize the diversity and rhythm at their end.

c. Various examples of micromorphisms:

The prostate is a group of microorganisms that contain a real tube and the real nucleus is distinguished from the non-real nucleus by the presence of the nuclear membrane and is characterized by the presence of specific centers to carry out cell activities, and the prostate includes three main groups (algae, protozoa and fungi). (Rodney P. Jones, Paul F. Greenfield, 1982)

*Algae:

They are two creatures with a real nucleus, green stems, leaves or roots, and they photosynthesize and their cells contain green plastids and some unicellular algae, and some of them are colonies of several cells, and some of them are more sophisticated compositions that resemble high-end plants, and not everyone can be considered microorganisms as some algae can be seen with the naked eye, but some of them reach a length of about (50 meters) such as brown moss.

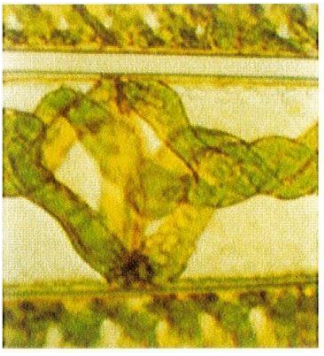

Figure (5) Spirugera moss

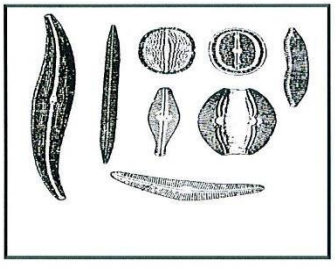

Figure (6) Euglena moss

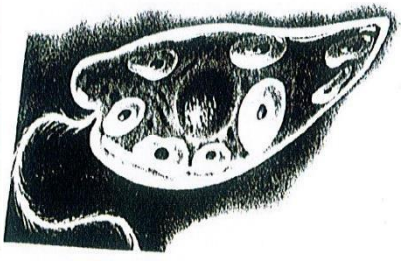

Figure (7) Diatoms and radilaria

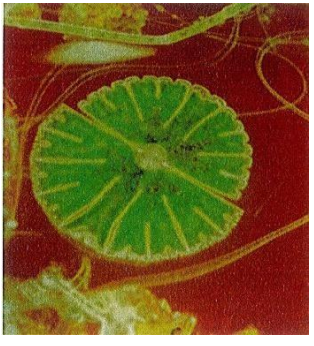

Figure (8) Green Moss

The shape in its general construction depends on the circular geometric system, where the shape appears in the form of two concentric semicircles, and this is confirmed by the presence of a focus in the middle is the center of the two circles, coming out of the circumference of the two circles regular straight lines in the direction of the center, but do not reach it.

* Lactic acid bacteria:

Lactic acid bacteria are a comprehensive taxonomic expression for bacteria that convert large amounts of sugar into lactic acid through the fermentation of lactic acid, and through the production of lactic acid, lactic acid bacteria also inhibit the growth of pathogenic microorganisms and many other microorganisms by reducing lactic acid bacteria. Ph They are widely known in the production of fermented foods such as butter and yogurt that can be naturally preserved for long periods of time. Since Louis Pasteur discovered lactic acid bacteria in 1957, it has been known for its beneficial effects on health and longevity. Recent studies show that in addition to regulating the intestines, lactic acid bacteria are also known to share immune activity, reduce swelling, anti-mutation, lower cholesterol, and have a hypotensive effect.

* Yeast:

It is known as the principle of fermentation and yeast is a microorganism necessary for the fermentation of alcohol and the making of bread. Yeast was discovered by the Dutch merchant Anthony van l'Wynn Hall (1632). – 1723) who first discovered the world of microorganisms, classification and yeast together fungal nuclei which differ from fungi in that they are generally unicellular throughout their life. Within the microbial world, they are a small group of microorganisms and yet they are essential to human life.

Yeast lives in sugar-rich environments such as nectar and fruit surface. in EM Yeast produces a lot of bioactive agents, amino acids and polysaccharides. (Rodney P. Jones, Paul F. Greenfield, 1982)

Second – Design concept:

Design is one of the main areas of artistic activity, as it is impossible to have any work of art without design, and it is also one of the technical foundations of contemporary life, as it includes architecture, furniture and other basic products in daily life, and design is that complete process of planning a form and creating it in a functionally satisfactory way as it brings passage to the soul and also satisfying the human need utilitarianly and aesthetically at the same time. (Fath al-Bab Abdel Halim, Ahmed Hafez Rashdan 1984)

Design is an art that depends in its composition on the elements of formation such as degradation, shape and color and does not stand on the limit of aesthetic relations between them, but the artist employs these relationships to achieve goals that meet the functional and aesthetic needs of man, and mentions "Ismail Shawky" in writing "Art and Design": The design of fertile materials that help the student to experiment freely in the elements of formation and the foundations of their construction by dealing with the formulations followed by the expression of ideas.

Design in the plastic arts means creating or creating beautiful things that are fun and beneficial to humans.

Design is that complete process of planning and creating a form in a functionally or utilitarian way and bringing pleasure and painting to the soul as well, and this is considered satisfying the human need for benefit and aesthetics at the same time.

Design is the organization and coordination of the sum of the elements, or internal parts in a coherent whole of the thing produced. That is, the harmony that combines the aesthetic and utilitarian side at the same time. (Ismail Shawky, 1997)

Ihab Bismarck mentions about the concept of aesthetic design that design is an innovative and productive process that aims to fulfill Muhammad's imposition, whether these opportunities are materially achieved by the performance of the producer for certain material functions. Or this purpose is moral, related to satisfying man's emotional needs and his need for a sense of beauty. (Ihab Bismarck Al-Saifi, 1993)

Known as Flynn. Bevlin "Design is the organization of parts into a coherent whole, and although it is a human expression, design is in fact a process formed through organizational processes of selection and evolution. (Bevlin, M.E,1970)

Design elements.

The visible nature with its infinite forms and forms is the largest source of design elements, and the invisible nature, which is observed by scientists and its minutes through a microscope, reveals more cosmic secrets of nature, where verses of aesthetic relationships are available, and through insightful vision and close observation using zoom lenses, many models unfold that are difficult to observe with the naked eye. (Ismail Shawky Ismail 2000)

When the designer experiments and deals with different variables of elements and the basis of evaluation, the designer may prove a number of those variables and experiment with one or more variables, for example, the designer may address a simple plastic unit such as the square that the triangle or circle is the basis for his artwork and proves its area and color while his experimental effort is conducted on its movements and repetitions in different matrices and organizations that increase in some parts of the designer's artwork and decrease in others.

Design elements and vocabulary are all that can be seen in a work of art, or the smallest elements that can be repeated, exchanged and stylized to be a whole that achieves a presentation, and it is difficult to isolate them, but they can be separated for study and identification and the powers inherent in them and what they can achieve in the work of art.", It is the vocabulary of the language of the form used by the artist and designer, and derives its variables during the passage of experience and aesthetic situations with nature and during its contemplation and examination, the initial elements arranged for the forms of nature are the same as the initial elements of the design has been termed as a point, line, shape, size, space, texture and color, which are in essence physical stimuli for the sense of sight, arising from the interaction of light with the material of the shape to reflect a different appearance of light, shadow and color, passing through the eye to occur vision. With their different morphological variations from point to size, their intrinsic reality is quantitatively and quantitatively different light reflections. (Abdel Aziz Ahmed and Mohamed Hafez El-Khouly, 1996)

Ismail Shawky Ismail says in his book "Design Elements and Foundations of Fine Art" that the elements of design are the vocabulary of the language of the form used by the artist designer and named elements of design or formation relative to their flexible capabilities in taking any flexible body and their ability to integrate and harmonize and unite with each other to be a total form of the artwork designer. Scientists, artists, and critics have differed in their identification, and others have agreed on their existence, such as:

- Point – Line Shape (Area) – Volume (Mass) Light and Shadow Texture (Surface Values) – Color Blank – Shape (Framework). (Ihab Bismarck Saifi, 1991)

These elements originate from nature, including the natural organisms and elements, starting with the smallest unit in the organism, specifically the nucleus of the cell, in which the most accurate processes that determine the genetic characteristics of the organism are carried out. By studying the genetic code material in the light of the design elements of dots, lines, contacts, spaces and colors, and its special beauty, it is the source of inspiration for the artist to create innovative works of art in all fields of art, including decorative design.

B – Line:

Calligraphy is considered a primary and basic means of visual communication as a basis for expression in plastic art, as it is an expressive plastic element with artistic values in the field of plastic arts, and the line is an identifiable extension and has a specifiable amount and a thickness that affects its degree of clarity in perception. And how means where it is straight, curved, wavy, refracted, or zigzag. etc., and the amount means the length of the line, while the thickness means the relative changes in thinness until the maximum degree in which it remains present in the perception as a line, and there is no doubt that its ratio to the proportion of the area on which it is located, contributes to that perception. (Ismail Shawky, 2001)

The line arises as a result of its launch from the center of a latent kinetic energy that takes its course in a special direction as required by the formal formulations of the artwork, and the line is the source of movement in the forms and bodies where its kinetic value is derived from its outer borders or main axes, where the line plays the role of the ocean or edge of the shapes, whether flat or stereoscopic and thus determines the shape of the shape.

Lines are either geometric in character or with free shapes. Free line shapes do not tend to be uniform due to the use of geometric tools, but geometric lines are not. It refers to straight and non-straight lines resulting from the use of well-known geometric tools such as ruler, angle, caliper, and others.

We find calligraphy in nature in the thin stems of the plant and tree branches and in sea snails, shells, oysters and other objects and various elements, and the characteristics of the line and its capabilities, organizations and rhythms vary according to how it is in the elements of nature. By examining the material of the genetic code and its various forms, whether by microscopic examination or by other means, we find the lines in their different forms in terms of their types and directions, and the lines vary from thin and thick lines between which light and dark areas are confined. The font has its plastic value and its connotations by which the content and final appearance of any design are formed. Through the multiple directions of lines that

decompose forces into almost equal forces, equilibrium is achieved. The lines also suggest movement and the diversity of rhythm, as well as a sense of vitality and beauty in contrast between the simple lines flowing and between the complex lines of many twisting and zigzag. Therefore, the researcher believes that it is useful to display the different types of calligraphy and images in the images of genetic code material, which helps to understand the essence of their formal systems, which helps to reach the extraction of decorative designs.

Font types:

The fonts are divided into two types:

1 - Simple lines include :

A – Straight lines:

(such as horizontal lines - vertical lines - human lines).

B- Non-straight lines:

(curved lines – curved lines – flowcharts).

2 - Composite lines, including:

A - Lines based on the straight line:

(Refracted line - parallel line - perpendicular line).

B – Lines based on the non-straight line:

(Zigzag line – spiral line – wavy line – spiral line).

C - Lines based on the line that is not straight or may combine them.

(Braided lines – dotted lines – intersecting lines – interlocking lines – dashed lines – convoluted lines – free lines – geometric lines – tangent lines)

Ninth: the practical aspect:

The objective of the practical side is the same as the objective of the research, and it is the same as the content of the research hypothesis, which states:

"There is a positive relationship between the type of morphological formulations of the line element and the type of microscopic sample."

To verify this hypothesis, the researcher examined what is available microscopically and related to the research sample and reached the following formulations:

Simple lines:

* Straight lines:

The straight line is the shortest distance between two points, or the path of a point in a fixed direction, and the straight line has three different positions (horizontal, vertical, and oblique).

Vertical line: "Each line has its beauty and has its expressive power The straight line gives the meaning of strength and the vertical straight line gives a sense of glory and transcendence such as lighthouses and minarets of mosques and trees with long stems, and high give a sense of growth and life and also suggests strength and vertical lines are found in the form of a number (10, 11, 12, 13), which illustrates.(Gatto, J.A. & Athers: 1978)

- Horizontal line: The horizontal line may be in nature an imaginary error hand in the confluence of the space line, i.e. the horizon with sea water and the line of confluence of the sky and the earth, a line that suggests calm and stability, and horizontal lines converge in composition with other vertical lines, they help achieve balance, because of the fact that lies from those lines of a conflicting free charge. (Ahmed Fotouh Al-Rifai, 1970)

The horizontal lines are found in the form of (14, 15), which shows.

- Oblique lines: Oblique lines are given compound sensations, whether ascending or descending, the nature of their deviation from the stable positions of vertical or horizontal lines gives the viewer a sense of approximation or tension, so the oblique line is packed with energy emitted towards the vertical and horizontal directions and the sense of intensity and strength of movement varies according to the degree of inclination of the line.

They are the lines that make an angle with the vertical and horizontal, and do not settle parallel to one of them. Its kinetic energy, which is contrary in its direction to vertical and horizontal lines, always makes it in an unbalanced position, making us feel its tendency to fall to settle in the horizontal position, or make us feel ascending until it settles in a balanced vertical position."

The oblique lines are represented in the form of the number (16, 17), which illustrates.

* Non-straight lines:

It is the one that takes in its path a fixed direction, the non-straight lines that would include the scattered elements and make them in a single design or configuration to become all characterized by unity and awareness of that. There are non-straight lines in nature in the embrace of the sky of the land and the sea and the bridge, which combines two lands and the dome of the mosque and the use of lines with wide curves in the composition raises in the soul a sense of calm, unlike the use of lines with sharp angles that give a sense of strength, and examples of lines are non-straight (curve, arched, streamline).

- Curved line: A dynamic line of the trajectory of a variable point with an appropriate curvature with its momentum, and these lines suggest slow or fast movement and are faster than straight lines, "A curved line is what is not straight in one of its parts or is the path of a point whose direction changes constantly"). (Rita Wadie, 1999)

We notice the curved lines in nature in the curvature of the wings of butterflies and in the branches of some trees and some plant leaves and in some species of birds and insects in the outer line specified for their bodies. It is found in the form of a number (18, 19, 20) which shows chromosomes.

- Streamline: A line with an open circular motion from one end of the line, starting with an arched curvature, then gradually decreasing to the other end, which is more rhythmic than a straight and

arched line because it changes the movement of its path and is varied according to the thickness of the whole line or one of its ends, its length and the amplitude of its rotation.

We note the flowing lines in some snails and in the flow of water and movement in the deep sea and are found in the images of microscopic shapes in the form of No. (21, 22), which illustrates.

- Arched lines:

They are lines with arches and give the soul a sense of calm such as rainbow arches, trees, and their branches, and are represented in vital art in the form of a number (23, 24).

* Composite lines:

Lines based on a straight line include parallel lines, perpendicular lines, and broken lines:

- Parallel step: They are two lines in one plane do not converge no matter how long the distance between the two lines is fixed and estimated by the length of the column between them, and parallel lines may take a horizontal position, or vertical or oblique with the difference in thickness, thus achieving a kind of difference between them that makes them more diverse, andreduces the severity of their symmetry, which may sometimes lead to a sense of boredom or control.

The parallel lines are represented in the microforms of bio art in the form of (13).

- Perpendicular lines : The vertical line and the horizontal line of the most famous examples of perpendicular lines, but also the lines that are present and can be perpendicular no matter how different the degree of inclination, and raises the convergence of vertical and horizontal lines perpendicular to the realization of the balance between those elements as the link of the vertical line gravity and the link of the horizontal line stability and flatness creates and notes the line perpendicular in microscopic forms in the form of No. (25, 26, 27) and clarifies.

- Broken line:

It is a sharp line that give a sense of strength and rigidity and are found in nature in some dry tree branches and hard mountain tops and are found in the microscopic forms of bio art in the form of No. (28, 29) where it illustrates.

Straight line:

Figure (10) A diagram showing the structure of the protein’s DNA. The diagram shows the shape of the line. (Lawrence Berkeley National Laboratory)

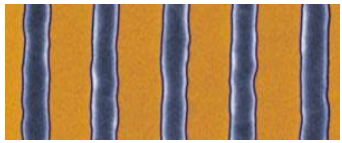

Figure (11) A picture of a colored electron microscope through a scanner. The roughness of the edges appears in lines of silicon with a capacity of 100 nm. The image shows the paths of straight lines, (National institute of standard and technology)

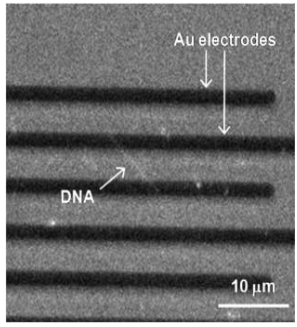

Figure (12) Image of a thiol fluorescent microscope marked with DNA wires between two small, mobilized electrodes (AU) for laser manipulation (gap width of arrays (AU) = 4μm). Models of the line (22) are shown in the diagram.

Balanced lines:

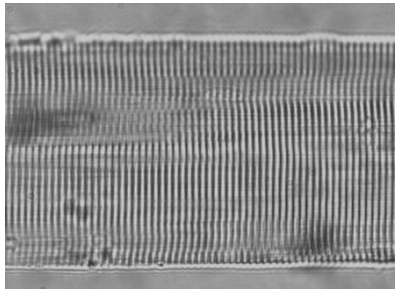

Figure (13) This is shown in a composite microscope where one of the banded fibers shows dark and bright vertical stripes. The fissures are called sarcomeres that form a transverse repeating structure every 2.4 microns.The structures are called longitudinally, repeating (sarcomeres). Examples of parallel repeating lines are illustrated in the diagram, (Cornell Chronicle, Daily news from Cornell University)

Horizontal lines

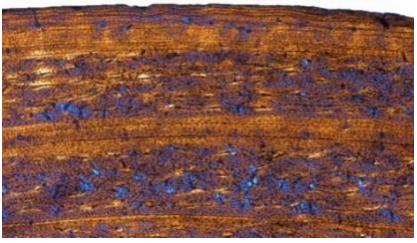

Figure (15) Models of microscopic growth patterns attributed to a slice of femur, , from a deer. The black stripes in the middle and top are similar to those found in dinosaur bones. Photo by Meike Köhler. It shows the paths of the horizontal lines of that slide.

(Sho Fujii a, Katsuaki Kobayashi a b, Katsuhiko Kanaizuka a, Tetsuaki Okamoto c, Shoichi Toyabe c, Eiro Muneyuki c, Masa-aki Haga November 2010)

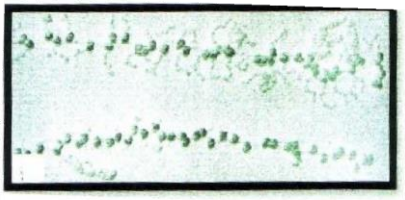

Figure (14) The chromosome of the fruit shrew (Drosophila) shows in the diagram successive phases of this chromosome. The figure shows a model of the horizontal line, (Hopkins Microbiology Course website)

Italics

Figure (16) Images of chromosomes inside DNA. The figure shows examples of diagonal lines, (Meng Xu 1, Wenfan Xie 1, Minren Huang, 27 July 2012)

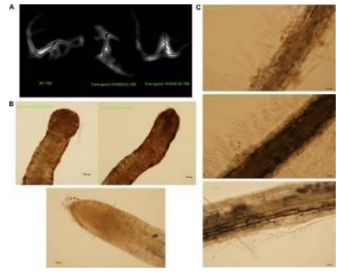

Figure (17) A group of figures illustrating the analysis of genetically modified plants of poplar trees. (A) Root systems for poplars of plants T89 NT or PeRHD3a and PeRHD3b GMO lines. (B) Microscopic analysis through plant roots T89 NT and PeRHD3a PeRHD3b genetically modified lines. Tape = 50 µm. (C) Microscopic analysis of root hairs of plants T89 or NT and PeRHD3a and PeRHD3b GMO lines. Bar = 50 µm, and the diagonals show the italics, (Laboratories JOLIOT-CURIE, Physics to study the living. Project leader, Christophe Place)

Curved line

Figure (18) A diagram showing the reproduction of the yeast chromosome. The curved line model is illustrated in the diagram. (Farzaneh Kazemipour a, Vona Méléder b, Patrick Launeau, January 2011)

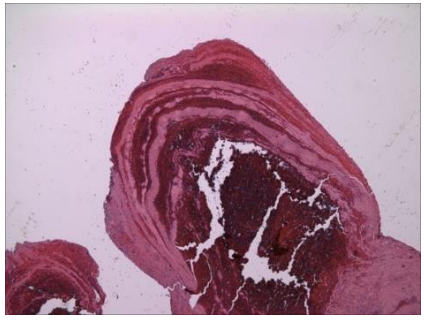

Figure (19) Micrograph of the shape of a clot, these successive layers (or these concentric lines) are called Zhan lines. It expresses the type of curved line. (Shuji Nakamura a, Motoyuki Suzuki a, Akira Sugimoto a, Kazue Tsuji, Takayama a, Mayuko Yamamoto a, Takeshi Otani a, Toshiya Inoue a, Akira Harashima a, Ayumi Okochi a, Ryuichi Motoda a, Fumiyuki Yamasaki b, Kunzo Orita a, Masayoshi Kibata a, February 2007)

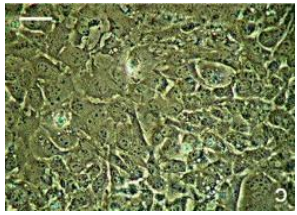

Figure (20) Microscopic analysis of HOZOT-4 cells and their surrounding environment. The diagram shows the curved lines of these cells, (science blog cancer research uk)

Streamline

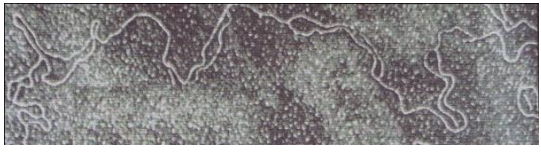

Figure (21) DNA image of a drosophila shrew.Magnified 30,000 times under the microscope. The shape of the flowcharts is shown in the picture, (Science X, JANUARY 2, 2006)

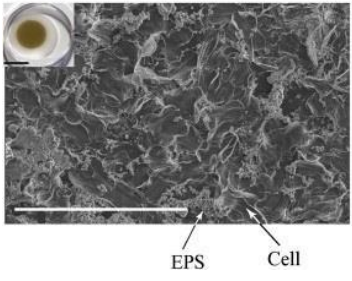

Figure (22) A microscopic model of a duplicate sample.It is clear from the figure that the cells are deposited on the urine filter seen by (SEM). Cells and EPS can be clearly detected on the image. We also observe the shapes of the flowlines through the repetition of the microscopic sample (Lawrence Livermore National Laboratory, May 2004).

Curved line

Figure (23) Image showing the morphological pathways of chromosomes within DNA in the form of curved lines, (National Library of Medicine, national institute of health,Lister Hill National Center for Biomedical Communications)

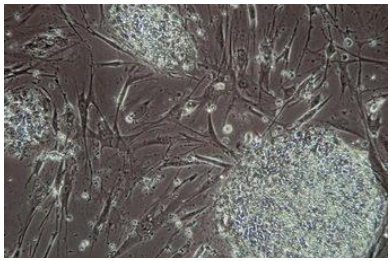

Figure (24) Microscopic presentation of the beginning of the formation of cell lines of a human embryo colony. Photo by Jeff Miller. The curved lines of the cell are shown. (Science X, JANUARY, JUNE 22, 2012)

Perpendicular lines

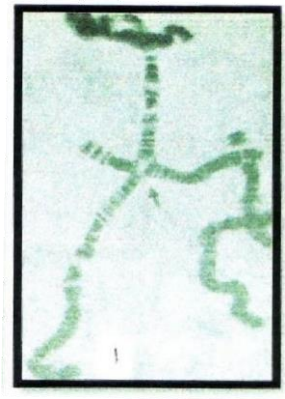

Figure (25) A picture of a pair of chromosomes during the separation phase . The figure shows an example of perpendicular lines (The Belgian Coordinated Collections of Microorganisms unite 7)

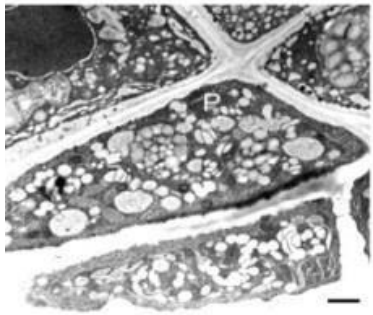

Figure (26) Microscopic sight of the electron. It shows us the obvious structural changes from the Golgi apparatus in the root cell periphery cover through the Kennesin line. The figure

shows the shape of these perpendicular lines (Sean B. Andersson, Daniel Y. Abramovitch ,mechanical engineering andersson lab, boston university, July 11-13, 2007)

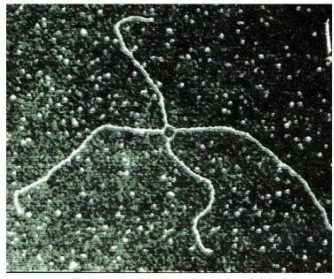

Figure (27) A picture of a pair of chromosomes during the separation phase. The figure shows an example of perpendicular lines (Huntington Potter,D Dressler, October 1976

Broken Line

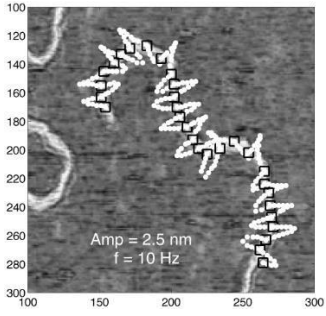

Figure (28) An image showing a DNA sample. The path (bright white) is superimposed on the image. As shown in the picture the broken line. (Hideyuki Yasuda, Kohei Morishita, Masato Yoshiya,Taka Narumi, Oct 2020,)

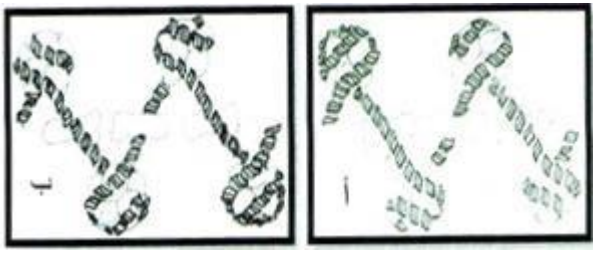

Figure (29) A model of the genetic code in which the broken line is illustrated. (Mohanty Pallavi, Sonika Bhatnagar, October 2017)

"The authors extend their appreciation to the Deanship of Research and Graduate Studies at King Khalid University for funding this work through Large Research Project under grant number RGP2/250/45 "

WORKS CITED

Abdel Aziz Ahmed and Mohamed Hafez El-Khouly (1996): Design Foundations System, Journal of Studies and Research, Faculty of Education, Helwan University, Cairo, Third Issue, Volume VIII, p. 240.

Ahmed Fotouh Al-Rifai, 1970, "Engineering Drawing", Popular Publishing House for Authorship, p. 31.

Ahmed Mohamed El-Sayed Youssef El-Beltagy (2004): "Inspiration from Microscopic Animal Cells to Create Pictorial Works", Master Thesis, Faculty of Art Education, Helwan University.

Bevlin, M.E,1970: "Design Through Discovery", Holt, Rinehart and Winatan, , , N. York P. 3.

Cornell Chronicle, Daily news from Cornell University, http://www.news.cornell.edu/releases/March99/APS.biochip.bs.html

Farzaneh Kazemipour a, Vona Méléder b, Patrick Launeau, January 2011, Optical properties of microphytobenthic biofilms (MPBOM): Biomass retrieval implication, Journal of Quantitative Spectroscopy and Radiative Transfer, Volume 112, Issue 1, Pages 131-142.

Fath al-Bab Abdel Halim, Ahmed Hafez Rashdan (1984) Design in Fine Art, Cairo, World of Books, p. 8.

Fath al-Bab Abdel Halim, Ahmed Hafez Rashdan (1984): Design in Fine Art, Cairo, Alam al-Kitab, p. 8.

Gatto, J.A. & Athers: 1978.

Haitham Wafik Madbouly (2004): "Computer Graphics Design to Simplify Concepts of Genetic Engineering for Early Adolescence", Master Thesis, Faculty of Specific Education, Ain Shams University.

Hideyuki Yasuda, Kohei Morishita, Masato Yoshiya,Taka Narumi, Oct 2020, Transformation from Ferrite to Austenite during/after Solidification in Peritectic Steel Systems: an X-ray Imaging Study, The Diamond Jubilee Issue: Selected Topics in Iron and Steel and Their Processing toward the New Steel Age, ISIJ International, Vol. 60 (2020), No. 12, pp. 2755–2764.

Hoda Abdel Aziz Mohamed Matar (2010), "Genetic code systems in living organisms as a source for the development of aesthetic formulations to enrich decorative design", Faculty of Specific Education, unpublished PhD thesis, Ain Shams University.

Hopkins Microbiology Course, https://www.stanford.edu/class/cee274s/photos.html

http://www.sciencenewsforkids.org/2012/07/patterns-in-dinosaur-bones-fuel-a-debate-over-whether-they-were-warm-or-cold-blooded/

Huntington Potter,D Dressler, October 1976, On the Mechanism of Genetic Recombination: Electron Microscopic Observation of Recombination Intermediates, Proceedings of the National Academy of Sciences 73(9):3000-4

Ihab Bismarck Al-Saifi, 1993, Aesthetic and Human Foundations of Design, The Egyptian Writer for Printing and Publishing, Part One, , p. 113.

Ihab Bismarck Saifi (1991): previous reference, p. 116.

Iman Ahmed Mahmoud, (2002): Microscopic Shapes as a Source of Inspiration for Innovative Ceramic Forms, Unpublished Master Thesis, Faculty of Art Education, Helwan University.

Iman Ali Mohamed El-Sharkawy (2003): "Mesh Systems in Fungal Spinning as an Entrance to Building a Decorative Painting", Master Thesis, Helwan University.

Ismail Shawky (2001): "Design: Its Elements and Name in Fine Art", Zahraa Press, Al-Sharq, Cairo, 3rd Edition - / p. 67.

Ismail Shawky Ismail (2000): Evaluation Elements and Foundations in Fine Art, Cairo.

Ismail Shawky, (2001), Design and its Elements and Foundations in Fine Art, 2nd Edition, Cairo Zahraa Al-Sharq Press, p. 67.

Ismail Shawky: (1997): Art and Design", Al-Mousky Press, p. 11.

Laboratoire JOLIOT-CURIE, Physics to study the living. Project leader , Christophe Place, http://www.ens-lyon.fr/Joliot-Curie/spip.php?rubrique9

Lawrence Berkeley National Laboratory, http://www.lbl.gov/Publications/Currents/Archive/Aug-06-2004.html

Lawrence Livermore National Laboratory, may 2004, Science & Technology Review. https://www.llnl.gov/str/May04/DeYoreo.html

Meng Xu 1, Wenfan Xie 1, Minren Huang, 27 July 2012, Biochemical and Biophysical Research Communications, , ScienceDirect, Volume 424, Issue 2, , Pages 239-244

Mohanty Pallavi, Sonika Bhatnagar, October 2017,Structural basis of focal adhesion targeting domain-mediated signaling in cardiac hypertrophy, Conference Paper in Canadian Journal of Biotechnology, Journal of Receptors and Signal Transduction

National institute of standard and technology, http://www.nist.gov/public_affairs/techbeat/tb2005_0616.htm

National Library of Medicine, national institute of health,Lister Hill National Center for Biomedical Communications, http://openi.nlm.nih.gov/detailedresult.php?img=2790454_1471-2229-9-138-3&query=the&fields=all&favor=none&it=none&sub=none&uniq=0&sp=none&req=4&simCollection=1568206_envhper00450-0230-a&npos=75&prt=3

Rania Abdo Mahmoud El-Imam (2003): "Plastic Values for Printing Real Contacts through Microscopic Vision of Animal Tissues and Their Applications in New Wall Pendants", Master Thesis, Faculty of Specific Education, Ain Shams University.

Rita Wadie: (1999): "Linear rhythm systems in the structure of selected sea snails as an introduction to teaching linear designs", Master Thesis, Faculty of Art Education, Helwan University, p. 47.

Rodney P. Jones, Paul F. Greenfield, 1982, Effect of carbon dioxide on yeast growth and fermentation, Enzyme and Microbial Technology, Volume 4, Issue 4, Pages 210-223

science blog cancer research uk, http://scienceblog.cancerresearchuk.org/2010/08/27/step-forward-for-brca2/

Science X, JANUARY 2, 2006, Scientists grow two new stem cell lines in animal cell-free culture, Source: University of Wisconsin-Madison. http://phys.org/news9493.html

Science X, JANUARY, JUNE 22, 2012, New DNA equipment reveals risk of so-called symptom-free lettuce big vein associated virus , Provided by Wageningen University, http://phys.org/news/2012-06-dna-equipment-reveals-so-called-symptom-free.html

Sean B. Andersson, Daniel Y. Abramovitch ,mechanical engineering andersson lab, boston university, July 11-13, 2007, A Survey of Non-Raster Scan Methods with Application to Atomic Force Microscopy, Proceedings of the 2007 American Control Conference Marriott Marquis Hotel at Times Square

New York City, USA.

Sho Fujii a, Katsuaki Kobayashi a b, Katsuhiko Kanaizuka a, Tetsuaki Okamoto c, Shoichi Toyabe c, Eiro Muneyuki c, Masa-aki Haga November 2010, Observation of DNA pinning at laser focal point on Au surface and its application to single DNA nanowire and cross-wire formation, , Pages 26-30, Bioelectrochemistry, sciencedirect,Volume 80, Issue 1.

Shuji Nakamura a, Motoyuki Suzuki a, Akira Sugimoto a, Kazue Tsuji,Takayama a, Mayuko Yamamoto a, Takeshi Otani a, Toshiya Inoue a, Akira Harashima a, Ayumi Okochi a, Ryuichi Motoda a, Fumiyuki Yamasaki b, Kunzo Orita a, Masayoshi Kibata a, February 2007, IL-2-independent generation of FOXP3+CD4+CD8+CD25+ cytotoxic regulatory T cell lines from human umbilical cord blood, Experimental Hematology, Volume 35, Issue 2, , Pages 287-296

The Belgian Coordinated Collections of Microorganisms unite 7, http://bccm.belspo.be/newsletter/8-00/bccm02.htm

Weinstock M. (2006): "Self-organization and material constructions, Techniques and Technologies in Morphogenetic Design", Wiley-Academy, March/April, USA.